

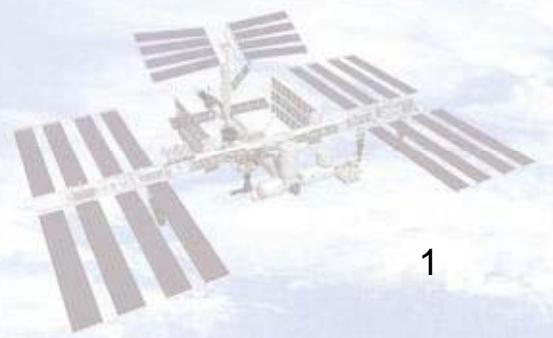


# Safety & Mission Assurance Knowledge Management Retention

Managing Knowledge for Successful Mission Operations

**Teresa A. Johnson**

NASA Johnson Space Center  
2101 NASA Parkway  
Houston, Texas 77058  
[teresa.a.johnson@nasa.gov](mailto:teresa.a.johnson@nasa.gov)  
281-244-2349





# Knowledge Management

S&MA/NASA Johnson Space Center

- **Safety & Mission Assurance (S&MA) promotes an atmosphere of knowledge sharing in its formal and informal cultures and work processes, and rewards the open dissemination and sharing of information; we are asking:**
  - “Why embrace relearning the “lessons learned” in the past?”
- **JSC population hired in the 1960's are slated to retire within the next two-three years. There are numerous strategies in Knowledge Management:**
  - Knowledge Delivery: Luncheons, Networking Groups
  - Expertise Identification
  - Knowledge Discovery
  - Knowledge Dissemination
  - Knowledge Mapping
  - Awareness





# KM Awareness

- Our S&MA Knowledge Capture Events focus on information sharing
- Knowledge Capture Events help to provide a gateway between future retirees and our next generation of managers/engineers
- S&MA hosted two Knowledge Capture Events during 2005 featuring three of our retiring fellows (Axel “Skip”Larsen, Dave Whittle and Gary Johnson)
  - *February 24, 2005* focused on two Safety and Mission Assurance Safety Panels (Space Shuttle System Safety Review Panel (SSRP); Payload Safety Review Panel (PSRP))
  - *December 15, 2005* featured lessons learned during Apollo, Skylab, and Space Shuttle which could be applicable in the newly created Crew Exploration Vehicle (CEV)/Constellation development program





# KM Dissemination

- Knowledge Exchanges/Capture Events are between people
  - Identify Experts, Exchange Events, Facilitate Communities, Facilitate Collaboration, Innovation
- Focus is on learning, but capturing knowledge assets is significant added value, opportunities are increased for collaboration by identifying where similar work is going on in the organization and who are the experts
- Industry considers knowledge capture informal events to be successful when the attendee range is 25 up to 125.
- S&MA documented the Knowledge Capture Events 1&2 via DVD
  - Knowledge Capture Event Vol. 1 – R/M# 719173 or DV0230
  - Knowledge Capture Event Vol. 2 – DV0393





# S&MA Knowledge Capture Event 1

- **Knowledge Capture Event 1 (February 24, 2005)**

- *Expertise Identified:* S&MA Panel Chairs
  - Axel “Skip” Larsen – Payload Safety Review Panel (PSRP)
  - Dave Whittle – System Safety Review Panel (SSRP)
  - *Index cards for capturing audience comments/questions*
- *Event 1 Proposal Development:* February 16-23, 2005
- *Knowledge Delivery Method:* **Unstructured**
  - *Small Auditorium*
- *Assessment of KM Event: Extremely Successful*
  - *Determined feasibility*
  - *Need of additional knowledge capture activities*

**Attendance: 40 personnel**



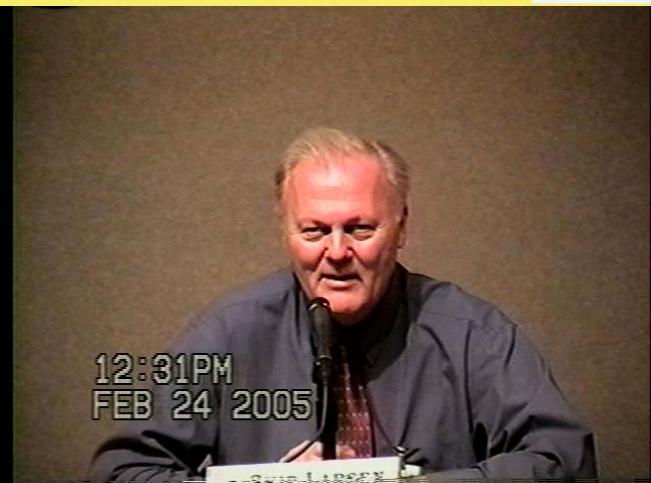


# Event 1 Insights



- NASA personnel change moving to other organizations and careers, HA/FMEA & CILs are the corporate memory for program risk.
- “Lessons Learned Databases” are rarely read, unique mechanisms like KM Capture Events could afford a different way to share knowledge and corporate information
- Space Shuttle Payload customers – STS-5
- Mentoring
- Boards/Panels
  - Lessons for CEV
- Multidiscipline Experience
- Communications
  - There is not just technical here it is important to know the structure the relationships the structured relationships you deal with interpersonal relationships rank right up there with being technically correct and technically accurate.
- Career
  - Dedicate yourself to the job that you are doing and yet at the same time keep the worry eye out for opportunities that can put you into a position where you will have increased responsibility







# In Their Own Words

Mike Ciancone Question: In fairly recent events the Space Ship One flight and the flight of the Chinese taikonaut. We have a NASA centered or even JSC centered view of human space flight world here yet we have a private venture and a venture from another country no involved with Space Station. What thoughts might you have about these two events?

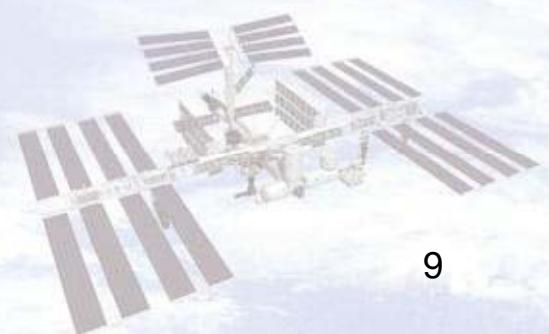
Harold Taylor Question: Do you expect a way the panels should operate in the new program or do you feel like the 15-30 years of experience that everything is pretty much carry the same operations over into the space exploration world..





# S&MA Knowledge Capture Event 2

- **Knowledge Capture Event 2 (December 15, 2005)**
  - *Expertise Identified:* Senior Manager/Engineer
    - Gary Johnson - Technical Advisor to S&MA Director
    - *Audience comments/questions taken at end of presentation*
  - *Event 2 Proposal Development:* December 7-14, 2005
  - *Knowledge Delivery Method:* **Structured**
    - *Large Auditorium*
  - *Assessment of KM Event:* *Extremely Successful*
  - *Attendance – 180 personnel*





# Event 2 Insights



- 1964-1969 Apollo - Redundancy Philosophy
  - (Lessons for CEV)
- Skylab – First CSM Docking (1973)
- Apollo Soyuz Test Project (ASTP) WG-4 (1975) CSM/Soyuz Second Docking/ CM Entry
- Space Shuttle – Orbiter Design/Walk Thru Inspections
- Flight Control Division (1978) STS-1 Orbit EGIL (1981)
- Challenger (1986) Code Q/ETB SR&QA Phase 1, 2, & 3 Training/TQM Hard to kill Centaur
- Shuttle/Mir (1992) JARSWG/Safety Policy/Cargo Safety/Systems Safety & Integrated Hazard Analyses
- NASA/Mir Phase 1 (1993)
- Mir Fire (1997) Progress Collision
- ISS/Phase 1 Russian Lessons – “Get Thrown Out the Door”
- Safety Culture Change

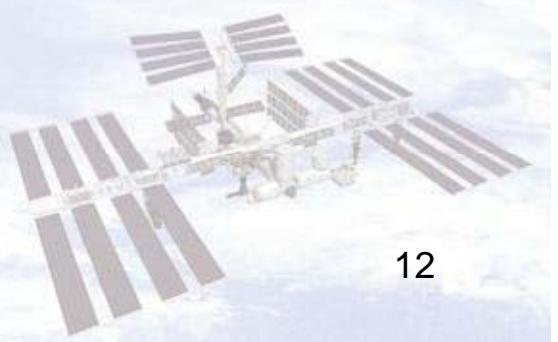






# In Their Own Words

Safety Culture, Software, Agency-wide expertise





# Key Findings

- Most NASA employees embrace the concept of Knowledge Management, the need for Knowledge Capture
- Almost half the attendees of the S&MA Knowledge Capture Events wanted a copy of the DVD and post transcript of the session
- Waiting until an employee retires limits the opportunity to afford cross evaluation by peers on genuine lessons learned during a life-long career
- S&MA Fellows shared their experiences with personnel across the center on the benefits of working developmental and operational programs





# Future Events

- S&MA EEE Parts Knowledge Capture Event
  - Retiree: Robert Sheppard/2Q06
  - Knowledge Delivery
    - Open Forum – Center wide invitation
    - Closed Forum – S&MA Disciplined engineer/Project leaders/Private Brainstorming

